



**MOHAMED SATHAK A J COLLEGE OF ENGINEERING**

Sponsored by Mohamed Sathak Trust

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Siruseri IT Park, Egattur, Chennai 603 103

**9. Funds from TNSCST and Other NGOs**

| S.No | Name of the Project/Workshop  | Organization                  | Amount in Lakhs |
|------|---|-------------------------------|-----------------|
| 1    | Hands on Training on Device to Device Communication in 5G network using Labview | TNSCST                        | 0.2             |
| 2    | Smart Water Management System   | Gowatr                        | 0.28            |
| 3    | Vibration Levels of Diesel Engine with and without turbocharger diesel engine   | Atalon Product Centre Pvt Ltd | 0.33            |
| 4    | Modal Analysis of a composite Beam  | Atalon Product Centre Pvt Ltd | 0.44            |
| 5    | Design of Electromagnetic Launcher for Propelling                               | Bharat Forge India Ltd        | 2               |

**PRINCIPAL**

**MOHAMED SATHAK A.J.COLLEGE OF ENGINEERING**  
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### Fund Received from TNSCST for conducting Hands on Training

 **தமிழ்நாடு அறிவியல் தொழில்நுட்ப மன்றம்**  
**TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY**  
(Established by Government of Tamilnadu)  
Directorate of Technical Education Campus, Chennai - 600 025  
Phone : 044 - 2230 1428 Web : www.tanscst.nic.in  
Telefax : 044 - 2230 1552 E-mail : ms.tanscst@nic.in/enquiry.tanscst@nic.in

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**DR. R. SRINIVASAN, M.Sc., Ph.D., F.I.C.S., M.A.C.S (USA)**  
Member Secretary

Ref: TNSCST/POP SCI/12/2020-21/ 3751 : 29.03.2021

To  
Dr. E. Dhiravidachelvi  
HOD, ECE  
Mohamed Sathak AJ College of Engineering  
Egattur, Chennai-603 103

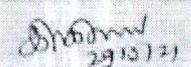
Sir/Madam,

Sub: Financial Assistance under Popularisation of Science (2020-21) -  
sanction intimation – Reg

Ref: Your proposal dt. 17.07.2020

With reference to your proposal cited above, the Council has sanctioned a sum of Rs.20000/- (Rupees Twenty thousand only) as financial assistance to conduct "Hands on training on device to device communication in 5G networks using LAB view". Kindly mention in all your communications, invitations and advertisements as that the programme is sponsored by TNSCST, Chennai and NCSTC, New Delhi.

Those who are not completed, kindly inform the exact date and venue of the programme within a week to the Council to enable us for monitoring the programme. Approved grant will be released on submission of Detailed Report, Utilization Certificate and Statement of Expenditure as per the guidelines.

Yours faithfully,  
  
29/3/21  
Member Secretary  
3751

Encl.: Guidelines and format of Utilization Certificate

Copy to:  
The Principal  
Mohamed Sathak AJ College of Engineering  
Egattur, Chennai-603 103



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Siruseri IT Park, Egattur, Chennai - 603 103.  
Ph: 27470021, 23, 24 & 25 Fax: 27470022

### Request letter

9/22, 3:45 PM

Mohamed Sathak A.J. College Of Engineering Mail - Gowatr - MSAJCE (Chennai) Briefing on R&D works - Project 1



Mr.S.Naveen Kumar Asst.Prof - ECE <ece.naveen@msajce-edu.in>

### Gowatr - MSAJCE (Chennai) Briefing on R&D works - Project 1

1 message

Thu, Jan 28, 2021 at 6:44 PM

hariharan <hariharanj@gowatr.com>  
To: ece.naveen@msajce-edu.in, vairaperumal.rvs@gmail.com, jjagansmec16@gmail.com, ece.malik@msajce-edu.in,  
ece.manju@msajce-edu.in  
Cc: Sathak GoWatr <sathak@gowatr.com>, Shreekant Jha <skj@gowatr.com>, vanchinathan  
<vanchinathan.v@openwavecomp.in>

Hi everyone,

As outcome of meeting held in our Gowatr office on 27/01/2021, the college team had asked us to send the details on which they were briefed upon, so I am attaching the Illustrations and the respective brief explanations. Please go through the files and get back to us in a week's time (04/02/2021) with all the possible outcomes that can be worked on to make this module work in real time scenario. Please feel free to contact us or make use of the Whatsapp group if incase of any queries.

Thanks & Regards

Hariharan J

Project Engineer

Gowatr Private limited.

+91 7305090679

Email ID: hariharanj@gowatr.com



Gowatr Private Limited,

Office address: No-3, 3<sup>rd</sup> Cross Street, Sterling Road, Nungambakam, Chennai-600 034.

4 attachments

Motor ON-OFF case 3.pdf  
14K

Motor ON-OFF case 2.pdf  
13K

Motor ON-OFF case 1.pdf  
10K

Gowatr - MSAJCE (Chennai) R&D works.pdf

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**Request letter**



B. Janarthanan <mech.jana@msajce-edu.in>

**Research work Regarding**

2 messages

giri@atalon.co <giri@atalon.co>

Fri, June 31, 2020 at 12:15 PM

To: mech.jana@msajce-edu.in <mech.jana@msajce-edu.in>

Dear Janarthanam,

"As per our discussion on the issues faced by us on "Study on Vibration levels of Diesel Engine with and without Turbocharger Diesel Engine", we would like you to take up this work and help us to solve this problem. We are confident that you may have people who are expertise in this field.  
Get into the finer details of the problem, be as clear as possible and break the problem into as many milestones as it makes sense. How long will it take to complete the work? Be sure to set out realistic expectations.

Thanking You  
Kind Regards

GIRI  
Atalon Product Center Pvt Ltd  
New No.: 9, NGO Colony  
Sriperumbudur-602105  
Kancheepuram District  
Tamilnadu India  
Ph: 919840335389

mech.jana@msajce-edu.in <mech.jana@msajce-edu.in>  
To: giri@atalon.co <giri@atalon.co>

Fri, June 31, 2020 at 08:00 PM

Greeting from Janarthanam B,  
Thank you for the opportunity given to us to solve the following problems on "Study on Vibration levels of Diesel Engine with and without Turbocharger Diesel Engine" by your company. Our goal is to help your company so that you can come out the challenges. You are already aware of our background in this field and expertise of our faculty members as we already have MOU with your company. We are more than happy to help you in this regard. We may take approximately three months to complete the work and submit the report.

With Thanks & Regards,  
Dr. B. Janarthanam,  
Professor & Head Research,  
MSAJCE

  
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**Request letter**



B. Janarthanan <mech.jana@msajce-edu.in>

**Research work Regarding**

2 messages

giri@atalon.co <giri@atalon.co>

Fri, September 3, 2020 at 01:05 PM

To: mech.jana@msajce-edu.in <mech.jana@msajce-edu.in>

Dear Janarthanam,

As we are satisfied with your on going work we would like to propose a another work "Experimental Modal Analysis of a composite Beam" , we would like you to take up this work and help us to solve this problem as like the previous one. We are confident with your previous work.  
Get into the finer details of the problem, be as clear as possible and break the problem into as many milestones as it makes sense. How long will it take to complete the work? Be sure to set out realistic expectations. as like you worked for thr previous work.

Thanking You  
Kind Regards

GIRI  
Atalon Product Center Pvt Ltd  
NewNo.:9,NGO Colony  
Sriperumbudur-602105  
Kancheepuram District  
Tamilnadu India  
Ph:919840335389

mech.jana@msajce-edu.in <mech.jana@msajce-edu.in>  
To: giri@atalon.co <giri@atalon.co>

Fri, September 4, 2020 at 10:30 AM

Greeting from Janarthanam B,

Thank you for giving us this opportunity again to solve the mentioned problem on "Experimental Modal Analysis of a composite Beam" by your company. we will work like ongoing work and will achieve the best result. We are more than happy to help you in this regard. We may take approximately three months to complete the work and submit the report as like the previous problem.

With Thanks & Regards,  
Dr.B.Janarthanam,  
Professor & Head Research,  
MSAJCE

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**Bharat Forge Limited – MSAJCE R&D works**

**Design of Electromagnetic Launcher for Propelling Projectile**

**Report**

**PRINCIPAL**  
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34, Rajiv Gandhi Road (OMR), Siruseri, Chennai-603 103.



## MOHAMED SATHAK AJ COLLEGE OF ENGINEERING

(Approved by All India Council for Technical Education,  
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Siruseri IT Park, Egattur, Chennai - 603 103

### Design of Electromagnetic Launcher for Propelling Projectile

#### Abstract:

Pulsed power supply system (PSS) plays an important role in rail gun system as it gives an electrical energy to rail gun in order to accelerate the projectile with higher velocity. Now-a-days the pulsed power supply system which feed the rail launcher is still large and it is important to think about the minimization of the stored energy. The pulsed power supply system that has well enough small mass and volume, yet can offer properly conditioned power, is a vital component for the successful accomplishment of rail gun system. All embracing works and researches are being carried out all over the world for the minimization of the volume occupied by the power supply and its weight. Capacitor based pulsed power supply systems are the most familiar form of pulsed power supplies system used in rail gun research for the past several years. The design of a 500kJ capacitor module pulsed power system, which can able to accelerate the projectile with a velocity of 1km/s to 1.5km/s, to be applied for the electromagnetic rail gun currently under investigation in India for surface fire support. We made an attempt to design a 500kJ PPS using computer simulation packages called PSPICE software in order to calculate the rail gun parameters such as acceleration of the projectile, muzzle velocity, peak current, current at exit, effective barrel length. Finally, this work gives some fundamental contemplation on volume and weight requirements of 500kJ capacitive PPS systems to be applied for speedy fire of electromagnetic rail guns. With the PSPICE simulation design & results, rail dimensions and PPS was provided for the procurement and fabrication. Residual charge after one shot in the rails was considered. Based on single shot results decision on multi-shot operation was made. Electromagnetic launcher was tested for its weight and velocity.

*Keywords: electromagnetic; Pulsed power; PSPICE; rail gun*

#### Components list:

Components used in pulsed power supply system with rail gun load are listed below

| S.No. | Component      | Values  |
|-------|----------------|---|
| 1     | Capacitor      | 2.3685mF  |
| 2     | Inductor       | Varying Inductor  |
| 3     | Spark gap      | Operating Voltage =50kV; Peak Current = 500kA           |
| 4     | Diode          | Peak Reverse Voltage & Current VRRM = 6000V; IRRM=100mA |
| 5     | Fuse           | Rated pulse current 6000A, Voltage 22kV                 |
| 6     | L' of the rail | 1.096 $\mu$ H/m   |

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### Benefits:

- Occupies less space,
- Has less weight,
- High operational reliability,
- Feasible financial condition,
- High power density, and
- High durability

### Results and Discussion:

500kJ pulsed power supply system that can be used in electromagnetic rail gun system has been designed using PSPICE simulation packages. Trade off study has been made to find the optimum number of capacitor stages to get desired current pulse shape and rail parameters. In order to identify optimum solution for 500kJ PPS, capacitors have been grouped into single, double, triple and five stages. For each capacitor connection pulse shaping inductance value, peak current value, current at exit, muzzle velocity, peak acceleration value, pulse width, effective barrel length of the rails have been calculated. It has been observed that an increase in number of stages in a capacitor bank module causes an increase in value of pulse width time, muzzle velocity of projectile, the time at peak current value, effective barrel length of the rails, current at exit and decrease in value of peak current and peak acceleration. It has been concluded that the 500kJ pulsed power supply can be able to accelerate a projectile at a velocity of 1.2km/s, when the capacitor banks are fired before reaching peak level current of previous bank. The work has also been carried out to calculate the approximate weight and volume occupied by the pulsed power supply using the manufactured data's. It has been concluded that the 500kJ pulsed power supply needed 0.6686 m<sup>3</sup> of volume with a total weight of 620kg.

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